# INFRASTRUCTURE WORKSHOP

March 7, 2013

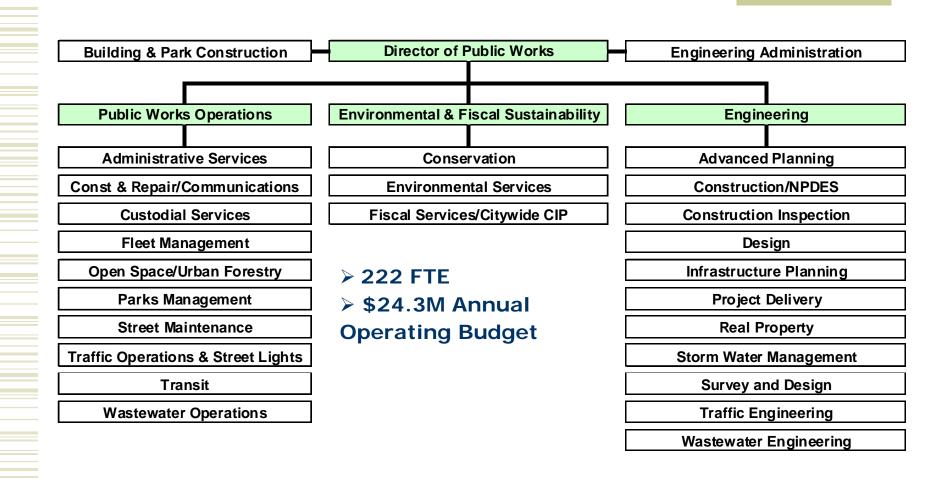


"above, below, and all around you"

#### MISSION STATEMENT

The Public Works Department's mission is to provide and manage the City's infrastructure, parks and open space through high quality operations, maintenance and construction in order to optimize mobility, public and environmental health and safety.

#### PUBLIC WORKS DEPARTMENT





## Citywide Strategies

Operational Excellence

Fiscal Health

Continuously Improve

Positive Experience Economic Vitality

Strong Vibrant City

Prosperous Environment Healthy Community

Environment Fosters Health & Wellness

> Restore & Protect Natural Resources

Assets & Facilities

Strong & Secure Neighborhoods

Public Infrastructure Maintenance

Crime Prevention & Emergency Prep

Response & Recovery

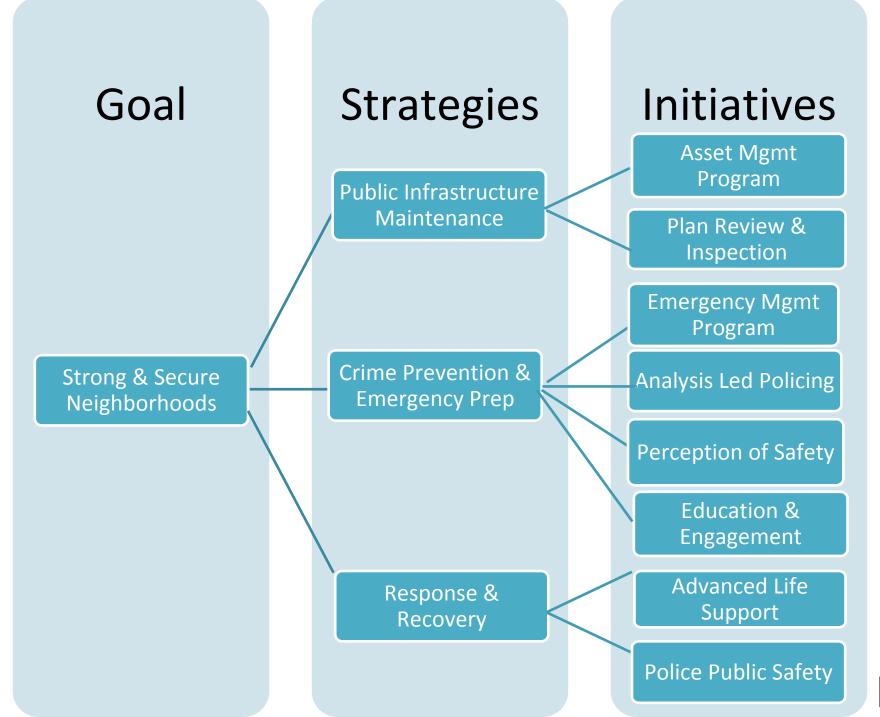
Connected Community

Civic Engagement

Enrichment programming









## **Goal 3:** Healthy Community

Strategy 3.3.
Provide parks,
open spaces,
outdoor
experiences,
libraries and
recreational
opportunities
that residents can
enjoy

- Initiative 3.3.1. Plan, construct, maintain and operate community and neighborhood facilities
- Initiative 3.3.2. Preserve and restore parks and open space systems through the Asset Management Program (AMP)





# **Goal 4: Strong and Secure Neighborhoods**

Strategy 4.1.
Ensure a
sustainable and
well maintained
infrastructure to
provide safe and
appealing
communities to
live, work and
play

- Initiative 4.1.1. Preserve and restore City Infrastructure (such as roadway, wastewater, and drainage systems) through the Asset Management Program (AMP)
  - Initiative 4.1.2. Provide comprehensive plan review and inspection services to ensure safety and code compliance



#### CHULA VISTA'S PUBLIC ASSETS

- Approximately 460 center line miles of paved public streets
- Over 1,000 miles of sidewalks and trails and paths
- Over 500 miles of sewer pipes
- ➤ 268 traffic signals
- Over 9,000 street lights
- > Over 27,000 street trees
- Over 500 acres of park land
- Over 2,000 acres of open space
- ➤ Over 4.2 Million LF of curb and gutters
- > 249 miles of storm drains
- Over 550 kW of Solar Photovoltaic systems
- ➤ Athletic Fields, Bridges, Civic Center, Drainage Channels, Equipment Inventory, Fire Stations, Fences, Golf Course, Guardrails, Jails, Libraries, Museum, Nature Center, Pipelines, Police Headquarters, Pools, Public Works Center, Recreation Centers, Retaining Walls, Rohr Manor, Visitor Information Center, South Bay Regional Household Hazardous Drop-off Facility, Street Signs, Vehicle Fleet...



### Asset Management

Managing assets to minimize the life cycle cost of ownership while delivering the service level at an acceptable level of risk

Optimized Stewardship

### Asset Management is about...

- Moving from reactive to proactive through managed solutions
- Working together towards a common goal of:
  - Maximizing asset useful life
  - Reducing risk
  - Minimize lifecycle cost
    - Optimizing O&M and asset replacement activities
    - Project validation (e.g., business case evaluation)
  - Understanding long-range capital investment needs
- Creating justification and documentation
- Making the right decision, at the right time, for the right reason, at the right cost

### Goal of Asset Management

#### Reactive

- Budgets based on last year
- Reactive projects
- · Projects based on budget
- Money invested with little risk reduction

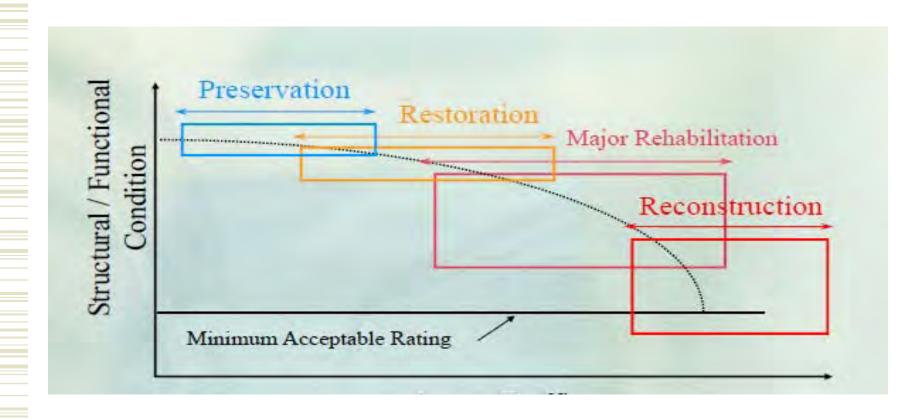
### Proactive

- Budgets based on future needs
- Replace high risk assets before failure
- Prioritize work based on risk
- Focus on high benefit to cost ratio

### Five Core Questions of Asset Management

- US EPA Asset Management Framework
- 1. What is the current state of my assets?
- 2. What is my required level of service?
- 3. Which assets are critical to sustained performance?
- 4. What are my best O&M and CIP investment strategies?
- 5. What is my best long-term funding strategy?

# ASSET MANAGEMENT PERFORMANCE CURVE



### ASSET MANAGEMENT PROGRAM (AMP)

2012		2013		
GREEN		GREEN	Wastewater Management System	WMS
YELLOW		YELLOW	Parks Management System	PMS
YELLOW		YELLOW	YELLOW General Government Management System	
YELLOW		RED	Building Management System	
YELLOW		RED	Fleet Management System	FMS
RED		RED	Drainage Management System	DMS
RED		RED	Roadway Management System	RMS
YELLOW		GREEN	Open Space Management System	OSMS
OSMS	New	RED	Urban Forestry Management System	UFMS

... 9 Asset Management Systems for 100 years of investments

# BASELINE ASSET MANAGEMENT CONDITION ASSESSMENTS

- Completed
  - Wastewater (pipes and pump stations)
  - Roadway (pavement only)
- In Process
  - Open Space
  - Wastewater (manholes)
- Pending Funding
  - Buildings, Drainage, Fleet, General Government, Parks, Roadway (sidewalks, curb & gutter, etc.), Urban Forestry



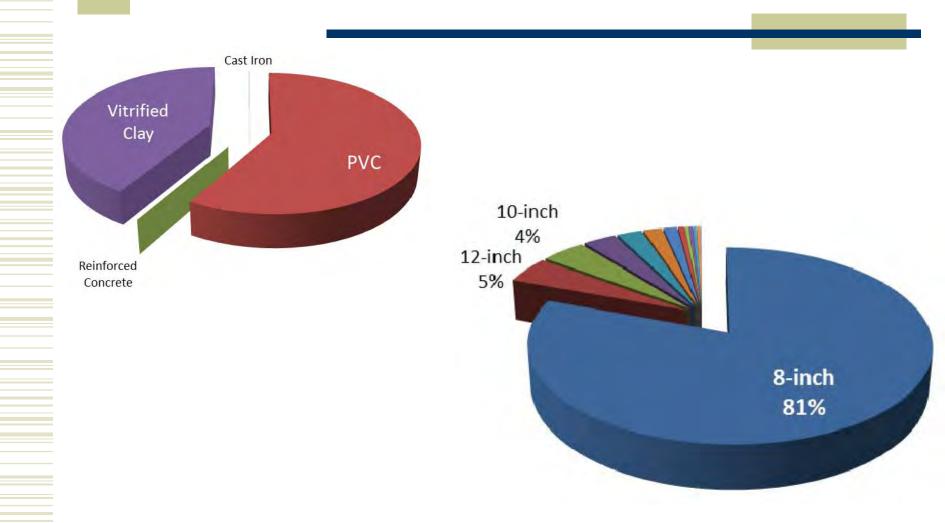
# WASTEWATER MANAGEMENT SYSTEM (WMS)

- > 500 Miles of Sewer
- > 12,000 Manholes
- ➤ 12 Pump Stations
- > 8 Wastewater Basins
- Approximate flow 16 Million Gallons per Day (MGD)
- Current treatment capacity is 21 Million Gallons per Day

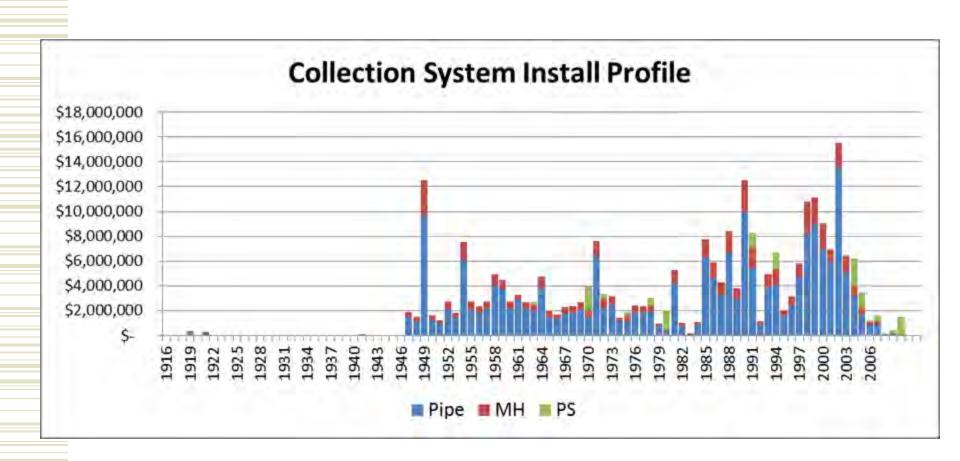


## What Do I Own and Manage?

## Collection Pipe Summary

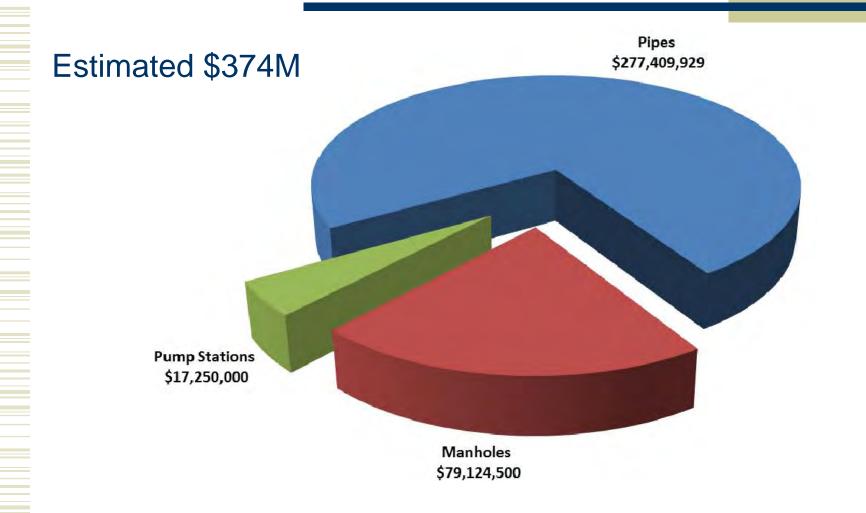


### Collection Pipe Installation Profile

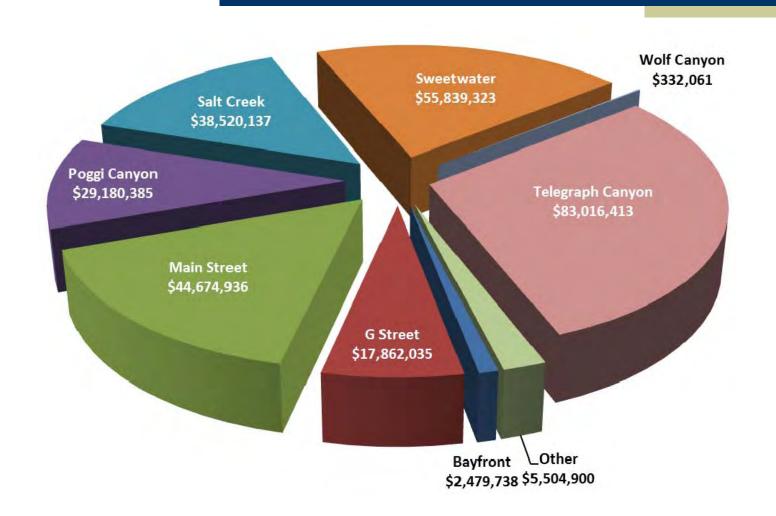


# What is my collection system worth?

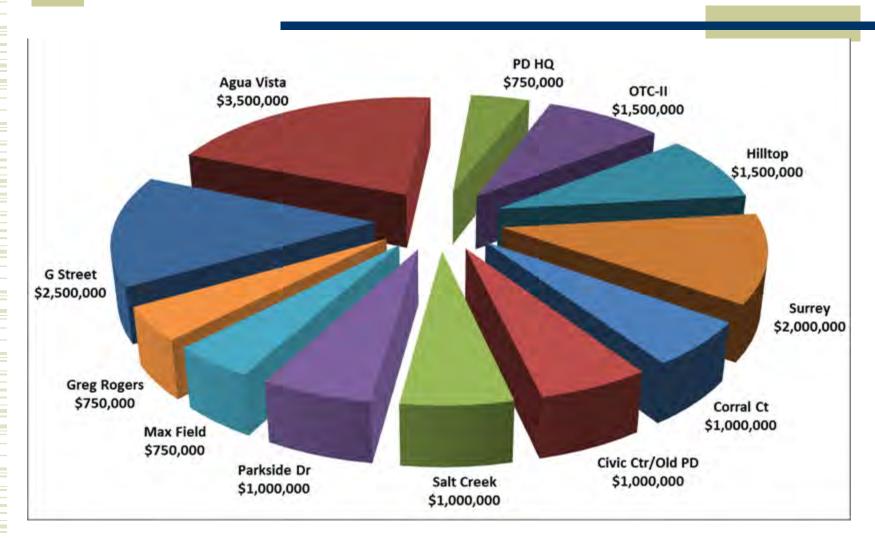
# Collection System Valuation



# Collection System Valuation: Pipes by Basin



# Collection System Valuation: Pump Station Valuation



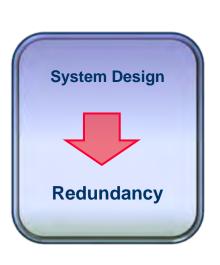
# What is my collection system risk profile?

### Which Assets are Critical?









BRE =

PoF

X

CoF

X

Redundancy

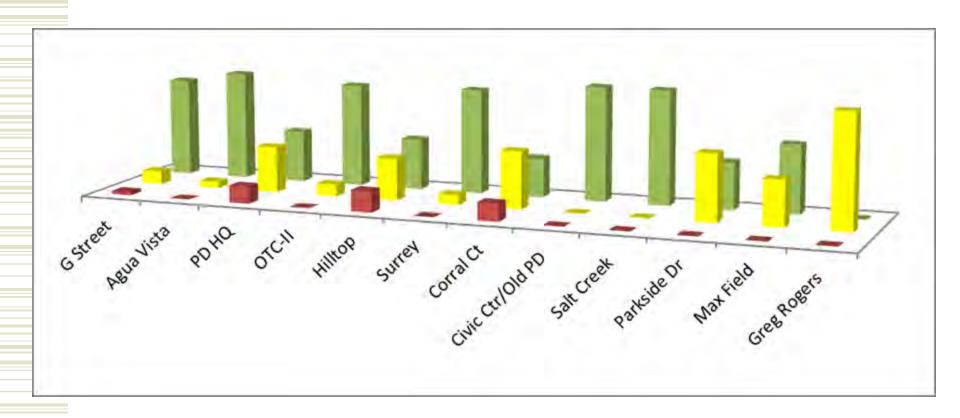
Structural PoF Operational PoF Triple Bottom Line (Economic, Environment, Social)

# Risk Profile: Pump Station (Corral Ct.)

Probability of Failure	5	3%	0%	41%	6%	13%
	4	0%	0%	0%	0%	3%
	3	3%	0%	0%	0%	3%
	2	3%	0%	0%	0%	0%
Pr	1	0%	0%	6%	6%	13%
Total Number of Assets: 32		1	2	3	4	5
		Consequence of Failure				

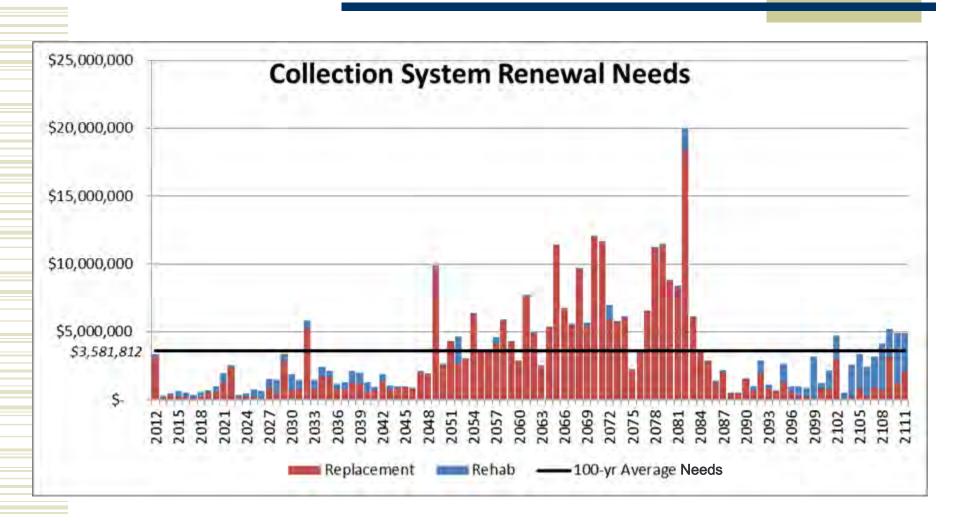
22%44%34%

## Risk Results (Pump Stations)

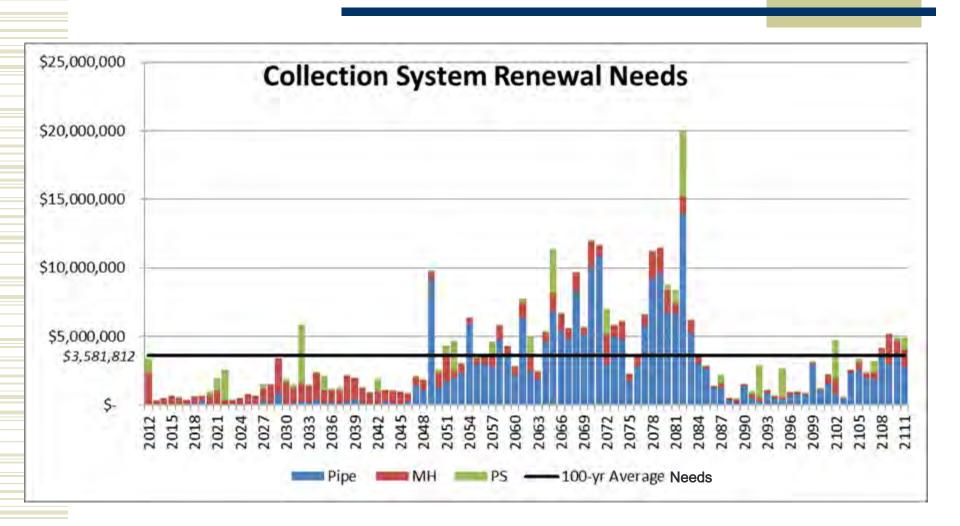


### What is my collection system's longrange capital investment needs?

### Projected Renewal Need



### Projected Renewal Need





# ROADWAY MANAGEMENT SYSTEM (RMS)

All City-owned assets in the Public Right-of-Way

- Pavement Arterials, Collectors, Residential
- Sidewalks and Paths (Peds and Bicycles)
- Curb/Gutter and Cross Gutters
- Traffic Signals and Street Lighting
- Railings and Fences
- Signs, Traffic Striping and Pavement Markings
- Utility Coordination
- Structures (Bridges, Retaining Walls, etc.)
- Street Trees (part of UFMS)







### CAPITAL PROJECT HIGHLIGHTS

#### Third Avenue Streetscape Project, Phase I







After



### CAPITAL PROJECT HIGHLIGHTS

#### East H Street Terra Nova Sidewalk Improvements





Before







### CAPITAL PROJECT HIGHLIGHTS

#### Hilltop Sidewalk Improvements







After  $\Longrightarrow$ 





# CAPITAL PROJECT HIGHLIGHTS CASTLE PARK ASSESSMENT DISTRICT

200 Block - Naples Street Improvements







After



### CAPITAL PROJECT HIGHLIGHTS CASTLE PARK ASSESSMENT DISTRICT

500 Block - Naples Street Improvements











### CAPITAL PROJECT HIGHLIGHTS CASTLE PARK ASSESSMENT DISTRICT

#### 1100 Block - Elm Street Improvements





Before



After



# FEBRUARY CITY COUNCIL PAVEMENT WORKSHOP

# Good and bad news for Chula Vista streets www.utsandiego.com/

www.utsandiego.com/news/2013/feb/12/pavement-streets-chula-vista

By Katherine Poythress 7:32 P.M. FEB. 12, 2013





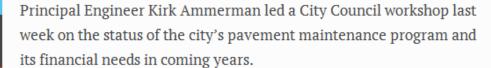






CHULA VISTA — Chula Vista fell \$89 million short of keeping up with street maintenance over the last seven years, but the good news is the city won't need as much to keep up in the future.







In 2006, consultant Margot Yapp of Nichols Consulting Engineers recommended the city invest at least \$19.2 million per year to maintain the streets at a level that she said would be both passable and prevent expensive rehabilitation later on.



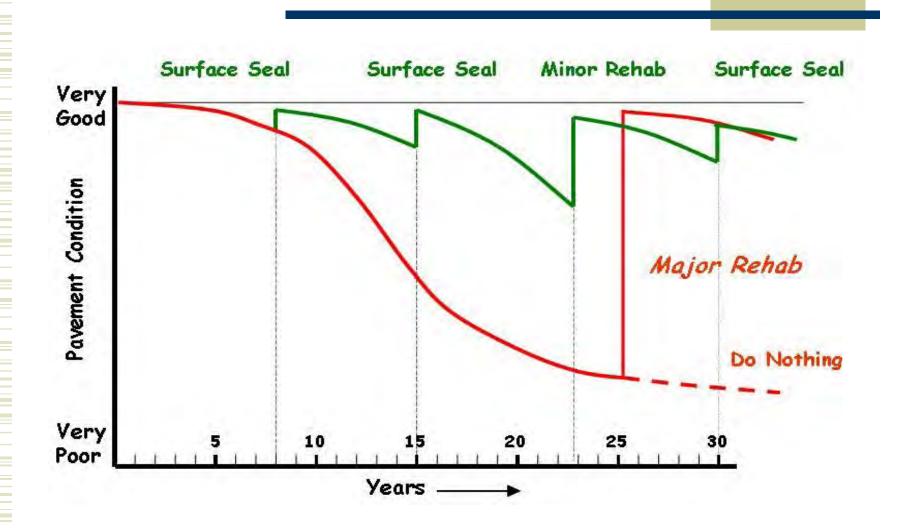
### PAVEMENT ASSETS

Category	Centerline Miles	Lane Miles	Area – Million Sq. Ft.	Current PCI*	Target PCI*
Arterials	58.3	287.4	22.0	82	80
Collectors	77.7	223.2	19.8	73	75
Residential	316.4	642.5	56.4	73	70
Alleys	10.6	22.0	1.3	51	
TOTAL NETWORK	463.0	1175.1	99.5	74	

<sup>\*</sup>PCI – Pavement Condition Index



# PAVEMENT PRESERVATION STRATEGIES





### REGULATORY SIGNS REPLACEMENT BACKLOG

- City has 23,479 signs that regulate traffic flow
- ▶ 638 signs measured to determine if they meet mandated reflectivity standards
  - Sampled areas in each of the four quadrants of the City
- 247 signs fell below the mandated reflectivity level – a 39% failure rate
  - estimate of 9,157 non compliant signs
- Striping & Signing has a backlog of more than 100 sign replacements for which we lack the resources to correct





# SIGN REFLECTIVITY INSPECTION BACKLOG

Backlog and Reflectivity Testing - Progress





# RMS ASSET MANAGEMENT FUNDING AND CRITICAL NEEDS

Inventory and Condition Assessment	\$250,000		
Critical Replacement and Repair Needs			
Faulted Sidewalks	\$250,000		
Gutter Replacements/Repairs	\$250,000		
Parking Lots Seals/Repairs	\$200,000		
Traffic Striping & Signing	\$250,000		
Annual Service Level Deficiencies			
Graffiti Eradication - hourly staff	\$60,000		
Increase to Street Sweeping Contract			
(currently \$150,000/year)	\$100,000		
Litter and Weed Abatement 2-Person Crew	\$145,000		
Estimated Deferred Maintenance - \$467 Million (Replacement of			

Estimated Deferred Maintenance - \$467 Million (Replacement of Sidewalk, Curb/Gutter, Pavement, Bikeway, Pedestrian, Traffic Signals, Street Lighting, Bridges, etc.)



### OPEN SPACE MANAGEMENT SYSTEM (OSMS)

### Asset Management Inventory and Condition Assessment in Process

- > Trees, Shrubs, and Ground Cover
- Irrigation Systems
- > Trails, Pedestrian Bridges, Lighting
- Environmentally Sensitive Areas (ESA's)
- Gates, Fences, Railings and Signs
- Misc. Hardscape (Ditches, Channels, Walls, and Monuments)
- Public and Private Commercial Landscape Inspection

### Long Term Maintenance Plans being prepared









# URBAN FORESTRY MANAGEMANT SYSTEM (UFMS)

- > Trim City Street and Park Trees
- Provide Storm Response
- Remove Dead and Unsafe Trees
- Provide Sign and Line of Sight Clearance
- Stump Grind and Root Prune
- Plant, Train and Water Young Trees

#### **Urban Forestry Risk Profile**

RED	Roadway Management System	RMS
RED	Park Management System	PMS
GREEN	Open Space Management System	OSMS







# UFMS ASSET MANAGEMENT FUNDING AND CRITICAL NEEDS

### Asset Management Inventory and Condition Assessment (not including Open Space) \$100,000

#### **Critical Need**

> Tree Trimming (2012 deficit of 4,695 trees) \$300,000

#### **Annual Service Level Deficiency**

Increase Tree Trimming contract (based on a 5-year cycle annual cost is \$450,000) \$340,000

Estimated Deferred Maintenance - \$915,000 (backlog of 13,418 trees to be trimmed based on 5-year trim cycle)



### FLEET MANAGEMENT SYSTEM (FMS)

- ➤ Police Dept 177 vehicles
- ➤ Fire Dept 47 vehicles
- ➤ Other Depts. 351 vehicles









# PREVENTATIVE VEHICLE MAINTENANCE

	PM'S COMPLETED	PM'S COMPLETED ON SCHEDULE (%) (1)	
2012-13 YTD <sup>(2)</sup>	479	51%	
2011-12	765	57%	
2010-11	712	42%	
2009-10	738	59%	
2008-09	942	52%	
(1) Goal is 70% (85% prior to FY07-08)			
(2) Thru February 2013			



### VEHICLE REPLACEMENT

FISCAL YEAR	NON-SAFETY VEHICLES(1) (2)	PATROL CARS (2)	
2012-13	7 of 8	7 of 7	
2011-12	0 of 24 <sup>(3)</sup>	0 of 6 <sup>(4)</sup>	
2010-11	0 of 19 <sup>(3)</sup>	10 of 10 <sup>(4)</sup>	
2009-10	0 of 12 <sup>(3)</sup>	14 of 19 <sup>(4)</sup>	
2008-09	0 of 10 <sup>(3)</sup>	10 of 19 <sup>(4)</sup>	
(1) Excludes Sewer funded vehicles.			

- (2) No. vehicles scheduled to be replaced.
- (3) Reflects extended replacement intervals.
- (4) Replaced at 100,000 miles vs. 80,000 miles.



# FMS CRITICAL VEHICLE REPLACEMENT NEEDS

Department	# of Vehicles	Replacement Amount
<b>Animal Care Services</b>	1	\$65,000
Community Patrol	14	476,000
Traffic Enforcement	1	34,000
Police Administration	1	28,000
Fire Administration	2	120,000
Fire Suppression	2	120,000
Public Works	9	747,000
<b>Outfitting Police Patrol Cars</b>		150,000
<b>Emergency Vehicle Purchases</b>		70,000
TOTAL		\$1,810,000



# FMS ASSET MANAGEMENT FUNDING

### Asset Management Inventory and Condition Assessment

Vehicle Inventory and Maintenance Records Managed in-House

#### **Critical Need**

Vehicle Replacement

\$1.8M

#### **Annual Service Level Deficiency**

Vehicle Maintenance – Two Additional Mechanics

\$150,000

### Estimated Deferred Maintenance of Vehicles – over \$8M



# DRAINAGE MANAGEMENT SYSTEM (DMS)

- Approximately 1.5 million feet of pipe (CMP, HDPE, PVC, RCB, RCP, VC) size ranging from 4" to 180"
- Approximately 1.6 million feet of channel (Brow Ditch, Concrete Lined Rectangular and Trapezoidal, Natural)
- Approximately 13,000 Public Access Points
  Clean Outs, Head Walls, Inlets, Junction Structures, NPDES
  Structures, Outlets)
- Approximately 150 Other Structures (Desilting Basins, Detention Basins, Gabion Structures, Water Quality Basins)







### CAPITAL PROJECT HIGHLIGHT

Bonita Canyon Emergency Construction Repairs



Before After During







### DMS PRIORITY REPAIRS

#### **Completed**

- Storm channel repair
  - Bonita Canyon
- Emergency Corrugated Metal Pipe (CMP) repair projects
  - 4th and E Street
  - F St (east of Woodlawn)

### Ongoing Monitoring due to High Risk of Failure

- Telegraph Canyon Channel erosion between Paseo Ladera and Medical Center Dr
- Long Canyon
- Poggi Canyon at Rancho Dr
- Broadway south of Main to Otay River





# DMS ASSET MANAGEMENT FUNDING AND CRITICAL NEEDS

### Asset Management Condition Assessment (Update to 2004/05 CMP Condition Study)

\$450,000

#### **Critical Needs**

➤ Telegraph Canyon Channel Erosion (between Paseo Ladera and Medical Center Dr) Phase 1

\$1M

> Storm Channel/Detention Basin Maint. Plans

\$225,000

> Flood Control & Invasive Plant/Debris Removal

\$250,000

Annual CMP Failures

\$600,000

#### **Annual Service Level Deficiency**

> Storm Channel Cleaning/Inspections

Estimated Deferred Maintenance (non CFD areas) - \$80 Million (Replacement of Drainage Facilities, CMP, Canyon/Channel Erosion, etc.)

\$60,000





# BUILDING MANAGEMENT SYSTEM (BMS)

The City owns over one million square feet of public buildings

- Animal Care Facility
- Civic Center
- > Fire Stations
- Libraries
- Living Coast Discovery Center
- ➤ Police Headquarters
- Public Works Operations Center
- Recreation Centers
- Visitor Information Center (E Street)
- > Other









# BUILDING MAINTENANCE AND REPAIR CHALLENGES













# BUILDING MAINTENANCE AND REPAIR CHALLENGES



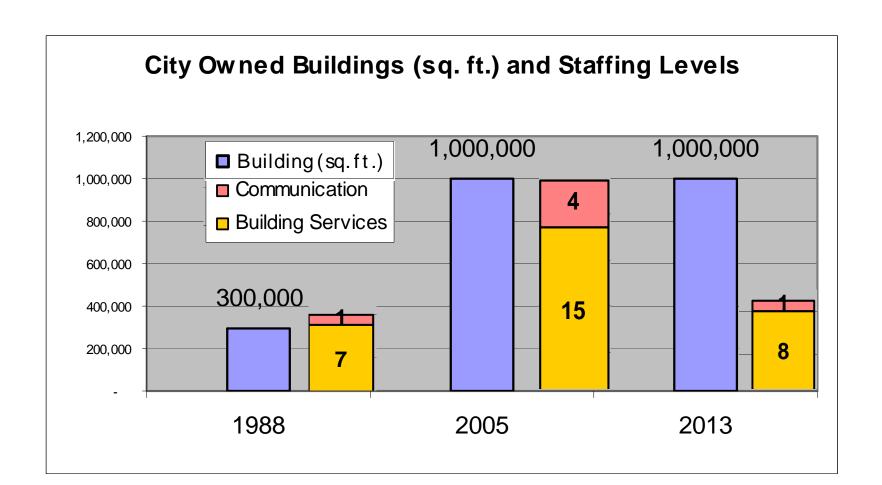








# CONSTRUCTION & REPAIR STAFFING REDUCTIONS



### **ENERGY MANAGEMENT UPDATE**

#### **Completed**

- Third-party energy audits at over 30 municipal sites
- HVAC System upgrades at Norman Park Center
- LED messaging signs installed at Library Energy Lounges
- Tariff switches to more favorable rates (21 sites \$95k in annual savings)
- Renegotiated direct access contract (4 sites \$50k in annual savings)
- Intervention in SDG&E Rate Case at CPUC

#### In Progress

- Over 3,700 street lights being converted to LED (arterial roads)
- Adaptive control study with SDG&E for street lights
- Additional solar installations at up to 5 facilities
- EV charging stations at 5 municipal sites (no cost)
- "Revolving Conservation Fund" to support energy & water upgrades

Estimated annual utility savings of over \$455,000









# BMS ASSET MANAGEMENT FUNDING AND CRITICAL NEEDS

Inventory and Condition Assessment	\$150,000
	Ψ130,000
Critical Replacement and Repair Needs	
Inspection of Fire Risers	\$110,000
Repairs at Recreation Facilities and Pools	\$150,000
HVAC Replacement/Repairs (various facilities)	\$190,000
Roof Replacement/Repairs (various facilities)	\$110,000
Emergency Generator	\$65,000
Annual Service Level Deficiency	
Facilities Structural Repair – C&R Position	\$90,000
Citywide Minor Capital Repair Budget	\$200,000
	••••

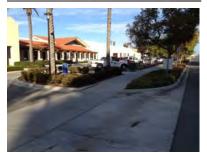
Estimated Deferred Maintenance of Buildings & Facilities – \$60 Million (Replacement of Roofing, HVAC, Plumbing, Electrical Systems, etc.)

# PARKS MANAGEMENT SYSTEM (PMS)

- > 533 Acres
- Over 75 separate Play Structures
- > 88 Athletic Fields and Trails
- > 64 Shelters 90 total Picnic areas, and BBQ's
- Benches, Monuments and Kiosks, Water Feature
- Over 62 Courts, 3 Dog Parks and 7 Skate Parks
- > 33 Restrooms, Parking Lots and Gates
- Fences and Railings and Drinking Fountains
- > Irrigation Systems, 4 Weather Stations
- Trees, Shrubs and Lighting
- Contracts, Pocket Parks, Medians and the Golf Course
- Park Ranger Program and Park Reservations







### How Do We Manage our Assets Now? Efficiencies? At What Cost?

- ➤ Contract Management: Paid or Trade?
- ➤ Ranger Lite, Volunteers
- ➤ Mow Crew
- ➤ Management Reports
- ➤ Turf Conversions, Plant Removal
- ➤ Decreased Service Level











\$30,000

\$400,000

# PMS ASSET MANAGEMENT FUNDING AND CRITICAL NEEDS

# Inventory and Condition Assessment \$150,000 Critical Needs ➢ Playground Surfacing (various parks) \$50,000 ➢ Playground Equipment Repair (various parks) \$300,000 ➢ Court Resurfacing (various parks) \$100,000 ➢ Tot Lot Installation (Valle Lindo and Los Ninos) \$80,000 ➢ Sidewalk Replacement (Tiffany and Discovery) \$175,000 Annual Service Level Deficiencies ➢ Enforcement/Supervision - Full Time Park Ranger Supervisor

Estimated Deferred Maintenance – \$20 Million (Replacement/Renovation of Fields, Playgrounds, Restrooms, Shelters, etc.)

Shrub and Weed Maintenance – Hourly Staff

Increased Water Use/Water Rate Increase



### GENERAL GOVERNMENT MANAGEMENT SYSTEM (GGMS)

- Communications Network
- Parking Meters
- Real Property
- Survey Control Network
- Utility Undergrounding

Estimated Deferred Maintenance of General Government Assets – under study



#### REAL PROPERTY

#### Real Estate Utilization

#### **Goal**:

To identify ways to generate revenue from the City's existing facilities which can be used to:

- Fund the maintenance and repair of the facility first, and
- Underwrite the cost of day to day operations and programming that benefits the community – or –
- Secure services that the City used to provide but are no longer funded

#### **Results**:

Rented the Ken Lee Building to South Bay Community Services

### SUMMARY OF GENERAL FUND FUNDING NEEDS

	AMP		Service Level	Maintenance
System	Assessment	<b>Critical Needs</b>	<b>Deficiencies</b>	Backlog
OSMS				
WMS				
GGMS				
PMS	\$150K	\$705K	\$535K	\$20M
BMS	\$150K	\$625M	\$290K	\$60M
DMS	\$450K	\$2.1M	\$60K	\$80M
FMS	\$0	\$1.8M	\$150K	\$8M
RMS	\$250K	\$950K	305K	\$467M
UFMS	\$100K	\$300K	\$340K	\$.9M
Total	\$1.1M	\$6.5M	\$1.7M	\$639M

### **FUNDING STRATEGIES**

- Assessment Districts
- Bond Measure
- > Fees
- Gas Excise Tax Increase
- Local Sales Tax Increase
- > Other (i.e. State Revolving Loans, Infrastructure Financing District)

### **NEXT STEPS...**

- Complete Asset Management Condition Assessments for Fleet, Drainage, Urban Forestry, Parks, Buildings, General Government, Wastewater (manholes) and Roadway (other than pavement)
- Develop funding mechanism involving a Bond Measure or other financing initiative
- CIP and Budget Workshop in April/May
- Final CIP and Budget adoption in June
- Sewer Rate Study and Master Plan presentation in Summer

#### Tools Available Online

#### Quick Links

#### www.chulavistaca.gov/goto/Engineering

- Bikeway Master Plan Update 2011
- Engineering Fees
- Forms
- FY 2012-2013 Proposed CIP Detail Sheets
- GIS Data
- Grading Ordinance No. 1797
- Interactive CIP Map | NEW!
- Laserfiche Documents
- Major Intersection Safety
- Pedestrian & Bicycle Safety
- Pedestrian Master Plan
- Permits
- Report an Issue

- Road Closures
- Slow Down, Chula Vista!
- Standard Drawings
- Stop on Red
- Stormwater Manual
- Subdivision Manual
- Traffic Operations
- Traffic Safety
- Vehicular Volume Counts
- Walk San Diego/Chula Vista Report
- Wastewater Master Plan
- Wastewater Reclamation Facility Feasibility Study
- Wireless Facilities Map

#### Online Interactive Maps

#### www.chulavistaca.gov/goto/Engineering



#### Capital Improvement Projects

View active Capital Improvement Projects such as Drainage, Payement Rehabilitation, Transportation and more.



Pavement Conditions/ Traffic Volumes

Search by address to find out the Pavement Condition Index rating of Chula Vista streets, as well as Daily Traffic Volumes



Survey Control Network

Search by address to view Benchmarks, Corner Records and Survey Control Points.



Interactive Street Sweeping and Waste Collection Schedule Map

ONLINE SERVICES

www.chulavistaca.gov/goto/PublicWorks





Report any infrastructure related problem.

Make an online park reservation for a gazebo or picnic area.

Open Space

www.chulavistaca.gov/goto/OpenSpace



Open Space Hotline (619) 397-6016

> General Dispatch (619) 397-6000

- Open Space Districts & Maintenance Community Facilities Districts
- Reporting Open Space Concerns
- Open Space Fiscal Year 2012-2013 Budget

The Open Space Section is responsible for the administration and management of ecological preserves, as well as erosion control and scenic landscaping, in the City.

### SeeClickFix

#### www.seeclickfix.com

